

What Matters in Graduate School?
Exploring Patterns of Student Engagement,
Academic and Personal Development

Huiming 'Ming' Wang
University of Missouri System
wanghui@umsystem.edu

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Abstract

This study investigates how graduate students are engaged in a unique spectrum of university and departmental activities proven to be important to their academic and personal development. Using the National Survey of Student Engagement (NSSE) conceptual framework, the graduate student engagement model is empirically developed and tested. Data collected from 2,504 graduate students at University of Missouri evidence that graduate students engage in educational activities in a similar pattern of undergraduates. Doctoral and master's students, regardless of gender, whether they are full or part time, have a consistent pattern of engagement. Students at different stages of the program have distinctive advising needs. Students with different career plans take unique patterns of engagement. What graduate education impacts students most is the personal development, followed by academic development. Students voiced the need for quality advising programs focusing on career options, as well as clearly communicated procedures in a timely fashion. Social life is another important aspect that needs to be improved.

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The desired outcome of higher education is student learning and development, rather than mere institutional resources accumulated (Kuh, 2001). The extent and quality of students' engagement in educationally purposeful activities is the single best predictor of undergraduate learning and development (Astin, 1993; Pascarella & Terenzini, 1991; Pace, 1980). At the undergraduate level, student engagement has been measured by the National Study of Student Engagement (NSSE). At the graduate level, however, similar conceptual framework has not been empirically studied. This investigation attempts to explore a graduate student engagement model to measure student learning and personal development.

Undergraduate Engagement Model

Based on well-researched principles of the importance of both challenge and support for student success, the National Study of Student Engagement (NSSE) addresses the many levels at which a student can be involved with the activities of the campus, with other students, and with faculty. These principles include student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents and ways of learning. Also important to student learning are institutional environments that are perceived by students as inclusive and affirming and where expectations for performance are clearly communicated and set at reasonably high levels (Education Commission of States, 1995; Kuh et al., 1991). The NSSE model framed the engagement concepts into five categories – level of academic challenge, active and collaborative learning, student interaction with faculty, enriching educational experiences, and supportive campus environment. Outcomes are listed as educational/learning and personal development.

Graduate Engagement Model

When applying the undergraduate model to the graduate, several considerations have been made based on characteristics unique to graduate programs. First of all, graduate education is departmentally based (Bowen & Rudenstine, 1992). The activities and responsibilities are decentralized. Secondly, the fields of knowledge are more uniquely specialized with corresponding curricula and instructional processes. Thirdly, desired learning outcomes are focused heavily on higher levels of learning.

The Graduate Student Survey (GSS) Instrument

The GSS instrument included the five aspects of engagement. Each aspect represented an important facet of good educational practice at the graduate level. Desired outcomes were measured in terms of academic and personal development, career preparation, and opinions about the university/department. A total of 58 items were designed, with most items on a five-Likert scale. The themes in the instrument were represented by:

- ◆ Level of Academic Challenge
- ◆ Active and Collaborative Learning
- ◆ Student Interaction with Faculty
- ◆ Enriching Learning Experience
- ◆ Supportive Campus Environment
- ◆ Academic and Personal Development
- ◆ Career Preparation
- ◆ Satisfaction with University Experience

In order to explore possible patterns of engagement and learning and to formulate research questions, we collected the following demographic information:

- ◆ Program: Doctoral; and Master's
- ◆ Ethnicity: Minority (African-American, American-Indian, and Hispanic); Asian; and White
- ◆ Gender: Male; and Female
- ◆ Full-time Status: Full-time; and Part-time
- ◆ Citizenship: U.S. students; and International students
- ◆ Status in Program: Taking Courses; Completed Courses; Passed Qualifying; Proposal Accepted;
- ◆ Career Plans: Faculty in Higher Education; Administrator in Higher Education; Government; Research/Industry; and Post-Doctoral

The reliability coefficient (Cronbach's alpha) represents the degree to which the items contributing to the construct consistently measure the same thing across respondents. The GSS 2002 reliability measure is based on a sample of 2,504 graduate students enrolled at University of Missouri in the spring semester of 2002. Table 1 presents the standardized item alpha reliability of each clustered item in GSS as compared with the NSSE 2001 instrument. Obviously, GSS has higher reliability in educational activities, but not the other two categories of items.

TABLE 1: RELIABILITY COEFFICIENTS
COLLEGE ACTIVITIES, EDUCATIONAL AND PERSONAL DEVELOPMENT, AND
OPINION ABOUT YOUR SCHOOL

Items	Cronbach Alpha	
	GSS	NSSE
Educational Activities	.93	.84
Academic and Personal Growth	.79	.88
Opinion about School	.68	.84

The Sample

In the spring of 2002, the Graduate Student Survey (GSS) was electronically distributed to a random sample of 6,097 graduate students at the University of Missouri. These students had been enrolled in both Fall 2001 AND Spring 2002 semesters and had ample university experiences to respond to the survey questionnaire. Three weeks following the initial delivery, 2,504 valid surveys were returned for data analysis, constituting an overall response rate of 41.1%.

Limitations

This study is subject to the following major limitations:

1. With a response rate of 41.1% in the survey research, the initial random sample selection design was not fully reflected in the final data set. Therefore, cautions are needed for any generalization from this sample.
2. The original purpose of the survey project was to collect data for the development of institutional strategic performance indicators. Due to the administrative awareness, such as the necessity to rate the quality of the programs, item scales did not directly measure the frequency of educational activities. As a result, the level of engagement was transferred from the common practices in satisfaction surveys. For example, if a student responded “excellent” to Item “Opportunity for meaningful interaction with faculty”, the rate was regarded as the highest level of engagement of this item.
3. With one out of three respondents being international students, the survey results have to be interpreted with extra caution.

Data Analysis

GSS 2002 and Respondents

Table 2 shows selected respondent characteristics. The right column represents GSS 2002 respondents; the left column shows the characteristics of students (population) as reflected by IPEDS 2001-2002 enrollment data at the University of Missouri. GSS 2002 mirrored the student profile in terms of master's or doctoral programs. Female, full-time, Asian, and international students are over-represented.

TABLE 2: COMPARISON OF GSS 2002 RESPONDENTS AND POPULATION (%):

		Population	GSS 2002
Program	Doctoral	41%	43%
	Master's	59%	57%
Gender	Male	46%	51%
	Female	54%	49%
Full-time	Full-time	51%	83%
	Part-time	49%	17%
Ethnicity	Minority	9%	5%
	Asian	4%	16%
	White	87%	78%
Citizenship	U.S.&P.R.	83%	65%
	International	17%	35%

Profile of GSS 2002 Respondents

Immediately prior to attending current graduate programs, about 58% of the doctoral students were either undergraduate or graduate students, 52% of the master's students were undergraduate students. One out of three students had been working in a related field (Table 3).

TABLE 3: PROFILE OF GSS 2000 RESPONDENTS:

		Doctoral	Master's
Prior Status	Undergraduate	18%	38%
	Graduate Student	40%	14%
	Volunteer	0%	1%
	Work/related fields	34%	34%
	Work/unrelated fields	8%	14%
Current Status in Prog.	Taking courses	34%	68%
	Completed course work	22%	19%
	Passed Qualifying	28%	7%
	Proposal Accepted	16%	5%
Career Plan	Work in Government	4%	7%
	Work in Hi-ed admin	8%	5%
	Work as Hi-ed faculty	48%	10%
	Work in industry/research	16%	50%
	Post-doctoral	17%	2%

At the time of responding to the survey, 34% of the doctoral students, and 68% of the master's students were still taking courses. Twenty two percent of the doctoral students had completed their course work; 28% passed qualifying exams; and 16% had had their dissertation proposals accepted.

When doctoral students were asked: “What do you plan to do once you secure your degree?”, 48% indicated their plans to be a faculty member in higher education; 17% would go for post-doctoral studies; 16% to industry/research; and only 4% implied they would work in a government.

Patterns of Graduate Student Engagement

Overall graduate student engagement is measured by the 22 items regarding levels of academic challenge, active and collaborative learning, student interaction with faculty, enriching learning experience, and supportive campus environment. Using ANOVA to explore if levels of engagement differ between ethnicity, gender, full-time status, program status, and career plan, interactions revealed in ethnicity ($F=47.64$; $DF=2$; $p=.000$) and career plan ($F=9.43$; $DF=4$; $p=.000$). When Tukey’s test was performed, statistical significances were demonstrated between Minority ($M=3.53$; $SD=.641$) and Asian students ($M=3.1$; $SD=.6$; $P=.000$); as well as White ($M=3.5$; $SD=.68$) and Asian students ($P=.000$). In addition, students who planned to be higher education faculty ($M=3.51$; $SD=.687$) scored higher in activity items than those who were going to work in industry/research ($M=3.26$; $SD=.669$; $P=.000$). Therefore, generally speaking, Asian students were less involved than students with other ethnicity; and students who were preparing to be higher education faculty were involved academically and socially at a comparatively higher level than those who intended to do research or work in industry upon degree completion.

Level of Academic Challenge

When demographic variables were used in ANOVA to determine group differences in the grand mean scores of the level of academic challenge items, omnibus F test revealed main effects with ethnicity ($F=52.92$; $DF=2$; $P=.000$), and career plans ($F=15.4$; $DF=4$; $P=.000$). Post hoc test showed statistical significance between Minority ($M=3.98$; $SD=.732$) and Asian students ($M=3.42$;

$SD=.848$; $P=.000$), as well as White ($M=3.93$; $SD=.8$; $P=.000$) and Asian students.

Using the groups in the career plans, four groups demonstrated statistical significance regarding level of academic challenge. They were: higher education faculty ($M=3.96$; $SD=.811$) and post-doc ($M=3.76$; $SD=.919$; $P=.037$); higher education faculty and research/industry ($M=3.58$; $SD=.812$; $P=.000$); higher education administration ($M=3.91$; $SD=.851$; $P=.006$) and research/industry; government ($M=3.91$; $SD=.787$; $P=.006$) and research/industry.

Independent *t-test* revealed differences in U.S. ($M=3.95$; $SD=.796$) and international students ($M=3.49$; $SD=.851$; $P=.025$); and full-time ($M=3.76$; $SD=.858$) and part-time students ($M=3.92$; $SD=.768$; $P=.005$).

Active and Collaborative Learning

For the active and collaborative items, main effects were displayed in ethnicity ($F=31.16$; $DF=2$; $P=.000$). Post hoc analysis resulted in statistical significance between Minority ($M=3.46$; $SD=.93$; $P=.000$) and Asian students ($M=2.91$; $SD=.841$), White ($M=3.43$; $SD=.946$; $P=.000$) and Asian students.

U.S. students ($M=3.44$; $SD=.938$) showed statistically higher levels of active and collaborative learning ($p=.012$) than international students ($M=2.99$; $SD=.858$).

Student Interactions with Faculty

Ethnicity ($F=7.28$; $DF=2$; $p=.000$), status in program ($F=3.11$; $DF=3$; $p=.026$), and career plans ($F=4.49$; $DF=4$; $p=.001$) had main effects on the levels of student interaction with faculty. Specifically, minority students ($M=3.68$; $SD=.908$; $P=.044$) showed a higher level of interaction with faculty than Asian students ($M=3.34$; $SD=.885$), and White students ($M=3.61$; $SD=.986$; $P=.000$) also had more interaction with faculty than Asian students.

Students who were focusing on completing the thesis/dissertation ($M=3.71$; $SD=.995$; $P=.018$) showed more interaction with faculty than students who were still taking courses ($M=3.52$; $SD=.934$).

Students planning to be future faculty ($M=3.75$; $SD=.953$) had higher levels of interaction with their current faculty compared with those planning to work in research/industry ($M=3.48$; $SD=.901$; $P=.000$).

U.S. students ($M=3.59$; $SD=.984$) demonstrated statistically higher levels of interaction with faculty ($p=.017$) than international students ($M=3.54$; $SD=.902$).

Enriching Learning Experience

Ethnicity ($F=26.98$; $DF=2$; $p=.000$), and career plans ($F=4.06$; $DF=4$; $p=.003$) had main effects on levels of enriched learning experience. Specifically, minority students ($M=3.35$; $SD=.86$; $P=.000$) showed higher levels of enriched learning experiences than Asian students ($M=2.72$; $SD=.771$), and White students ($M=3.21$; $SD=.847$; $P=.000$) also had more experiences in enriched learning than Asian students. In addition, students planning to be future faculty ($M=3.15$; $SD=.844$) had higher levels of enriched learning experiences compared with those planning to work in research/industry ($M=2.87$; $SD=.816$; $P=.002$).

Supportive Campus Environment

ANOVA only revealed statistical differences in ethnicity ($F=10.22$; $DF=2$; $p=.000$) regarding student opinions about the supportive campus environment. Furthermore, post hoc test only showed different levels of involvement between Asian students ($M=3.24$; $SD=.771$) and White students ($M=3.46$; $SD=.773$; $P=.000$).

Graduate Student Academic and Personal Development

Academic Development

Independent t-test showed that doctoral students ($M=3.73$; $SD=.504$) scored significantly higher in levels of academic development than master's students ($M=3.46$; $SD=.557$; $p=.002$).

Status in program ($F=10.99$; $DF=3$; $p=.000$), and career plan ($F=40.02$; $DF=4$; $p=.000$) had main effects on levels of academic gain. Three of the four groups in status of program evidenced statistical significance in post hoc tests: proposals accepted ($M=3.76$; $SD=.561$) and taking courses ($M=3.57$; $SD=.549$; $p=.000$); proposal accepted and completed courses ($M=3.55$; $SD=.541$; $P=.000$). Different levels of academic gain were also found in six pairs under career plans defined by where students wanted to work upon degree completion: faculty ($M=3.89$; $SD=.485$) and post-doc ($M=3.72$; $SD=.48$; $p=.003$); faculty and higher education administrator ($M=3.6$; $SD=.53$; $p=.000$); faculty and government ($M=3.53$; $SD=.441$; $p=.000$); faculty and research/industry ($M=3.48$; $SD=.517$; $p=.000$); post-doc and government ($P=.042$); and post-doc and research/industry ($P=.0.00$).

Personal Development

ANOVA demonstrated main effects in personal development grouped by students' status in the program ($F=9.17$; $DF=3$; $p=.000$). Post hoc tests showed statistical significances between students whose proposals were accepted ($M=4.01$; $SD=.673$); and those who were taking courses ($M=3.88$; $SD=.658$; $p=.000$); and proposals accepted and completed courses ($M=3.9$; $SD=.623$; $p=.002$).

Doctoral students ($M=4$; $SD=.632$) displayed higher levels of personal gains than master's students ($M=3.89$; $SD=.674$; $p=.031$). Furthermore, international

students ($M=3.97$; $SD=.599$) evidenced higher levels of personal gain than U.S. students ($M=3.91$; $SD=.685$; $p=.000$).

Career Preparation

Ethnicity was significant using career preparation as the dependent variable ($F=7.14$; $DF=2$; $p=.000$). White students ($M=3.09$; $SD=.648$) felt significantly better prepared for their careers than Asian students ($M=2.92$; $SD=.589$; $p=.000$). U.S. students ($M=3.09$; $SD=.653$) were more positive about their career preparations ($p=.031$) at graduate schools than international students ($M=3.02$; $SD=.614$).

Satisfaction with University Experience

ANOVA evidenced significant different levels of overall satisfaction in ethnicity ($F=4.62$; $DF=2$; $p=.010$). The post hoc test showed statistical differences between Black students ($M=3.63$; $SD=.568$) and White students ($M=3.47$; $SD=.606$; $p=.028$); and minority and Asian students ($M=3.42$; $SD=.575$; $p=.007$).

Discussion

Understanding patterns of graduate student engagement in educational practice helps focus faculty, staff, students, and others on the tasks and activities that are associated with higher yields in terms of desired student outcomes. Toward these ends, faculty and administrators would do well to arrange the curriculum and other aspects of the graduate school experience in accord with the good practices.

Graduate education has been described as a process of socialization, or engagement in this study, to an ultimate professional role (Baird, 1990a; Stein and Weidman, 1990). This process involves learning the “specialized knowledge, skills, attitudes, values, norms, and interests of the profession”

(Bragg, 1976, p.1). The graduate faculty is the critical agent conducting this engagement, because its members define knowledge and disciplinary values, model the roles of academics in the discipline, and produce practical help and advise (Stein & Weidman, 1990). Graduate student peers are the other socialization agent (Baird, 1990a; Tinto, 1991); this group is seldom given formal recognition. Thus, engagement at the graduate level would also involve processes similar to those at the undergraduate level described as academic and social integration (Tinto, 1987; 1993). However, these concepts have a different meaning at the graduate level and vary with the stages of the academic program (Baird, 1972; 1990a; Katz, 1976; Tinto, 1993). That is, as students progress through their program, they become integrated into their institution, department, and disciplines. Since the different stages of the graduate program have different tasks and demand, the relations of students with faculty and other students also differ. As students progress through their program, they are increasingly assimilated into the life of the department and discipline, and their access to and interactions with faculty increase as a result (Baird, 1972; Tinto, 1993). Especially among doctoral students, those at the beginning of their program are still learning the expectations and demand that the discipline places on them, and they are thus somewhat distant from faculty. Those at the dissertation stage have served their apprenticeships, have engaged in the norms and methods of the discipline, and are expected to work closely with faculty. Students at the beginning of their programs may see other students as unknown competitors in contrast to students at later stages, who view other students as part of a departmental community (Lozoff, 1976; Baird, 1990s).

This institutional study confirmed many aspects of the previous research. For example, students who were writing a dissertation showed a significantly higher level of interaction with current faculty. They also reported higher levels of academic and personal development. Career aspiration, on the other hand, appeared to be an important factor in determining levels of engagement. Future faculty were involved to a larger extent with both their current faculty/advisors

and their peer graduate students. They reported more enriched learning experiences. They also evidenced higher levels of academic and personal gains during their graduate studies.

Survey items on higher level of learning such as 'learn on my own', 'enhanced thinking skills', and etc., generated the highest mean item scores. The lowest mean scores were clustered on the items regarding "career options in and outside higher education", "preparation to teach", and "support socially", to name a few.

Implications for institutional improvement derived from the current study are many sided. First of all, advising programs need to be strengthened at every stage of the program. Step by step program handbooks are crucial not only to measuring the graduate advising programs, but also to engage students on the task and demand. In addition to focusing on course work and research, students at different stages of their program have distinctive advised needs. However, career plans should be determined and communicated with the major advisor(s) at an possibly earlier stage of the study. This study pinpointed problems with graduate student advisement on career perspective both inside and outside the higher education world. Students also felt strongly that quality of advising should be included in graduate faculty evaluation.

Secondly, the study highlighted the need to provide teaching opportunities for those who aspired to be future faculty. The Preparing for Future Faculty (PFF) program, for example, is a national initiative to make graduate preparation more consistent with the actual responsibilities of faculty members. Doctoral students are exposed to the varying emphases placed on teaching, research, and service at a wide variety of postsecondary institutions. PFF gives future faculty a chance to acquire and hone pedagogical, administrative, and interpersonal skills before entering the job market. Moreover, by exploring different kinds of campus cultures, PFF Fellows are more likely to know which kind of institution best suits their personal and professional goals. One of PFF's long-range goals is to

change the culture of higher education by institutionalizing future faculty training in all disciplines.

Thirdly, more attention should be tuned to the quality of graduate students' social lives. In spite of the comparatively higher rates on faculty and student interaction items, students, in their comments, told the feeling of isolation, loneliness, and lack of communications. They recommended more interaction with faculty and students outside the classrooms and labs, as well as on social occasions. They were looking forward to getting to know people from different departments and disciplines, even different schools and universities.

Finally, this study illustrates the need for the development of a valid and reliable instrument to measure student engagement at the graduate level across the nation. Graduate education, both its undisputed importance and its substantial cost would seem to justify considerably more attention and systematic empirical investigation. In the mean time, we need to bear in mind that because graduate education is departmentally and disciplinary based, the decentralization of activities complicates enormously the task of even describing the process in anything like general terms, quite apart from collecting the most basic data (Bowen and Rudenstine, 1992). In spite of its intricacy, a number of nationally known attempts have been very successful in assessing graduate student satisfaction and critical processes. Such efforts are represented by the surveys conducted by Golde and Dore (2001), the Higher Education Data Sharing (HEDS, 1999; 2002), the National Association of Graduate and Professional Students (1999), and the National Science Foundation (NSF, 1999), to name a few. One most important observation from the current study demonstrates that doctoral and master's students, regardless of gender or whether they are full or part time, had a relatively consistent pattern of engagement in educational activities. This could imply not only the feasibility of, but also the benefit to collecting data on an even broader scale. In addition, numerous schools of graduate studies and research assess their local student satisfaction at intervals. With quality-integrated research on well-designed and replicated studies,

patterns of graduate student engagement based on the NSSE undergraduate model will take shape in the near future. We are looking forward to be part of this endeavor.

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